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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,369	04/09/2004	Yen-Chieh Huang	DEE-PT166	1206

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EXAMINER	
LANE, JEFFREY D	

ART UNIT	PAPER NUMBER
2828	

DATE MAILED: 05/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

H:A

Office Action Summary	Application No.	Applicant(s)	
	10/821,369	HUANG ET AL.	
	Examiner	Art Unit	
	Jeffrey D. Lane	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

2. The disclosure is objected to because of the following informalities: The applicant seems to define "optical lens" as "reflector" this is contrary to the normal definition of lens which is: ***1. a.*** *A piece of glass, or other transparent substance, with two curved surfaces, or one plane and one curved surface, serving to cause regular convergence or divergence of the rays of light passing through it* (Oxford English Dictionary). For examination purposes the phrase "optical lens" will be interpreted by "reflector", as shown in fig.7 of instant application.

Appropriate correction is required.

Claim Objections

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

3. Claims 26, 29, 38 are objected to because of the following informalities: The applicant seems to define "optical lens" as "reflector" this is contrary to the normal definition of lens; for examination purposes the phrase "optical lens" will be interpreted by "reflector". Appropriate correction is required.

4. Claims 21, 27, 37, and 39 are objected to because of the following informalities: Acronyms, such as "PDT", "PDD" and "QPM", should be defined in the claim before being used in the claim. Appropriate correction is required.

5. Claim 21 is objected to because of the following informalities: there is a duplication of the phrase "wavelength converter" on line 3. It will be interpreted as " a wavelength converter converting..." Appropriate correction is required.

6. Claims 21 and 37 objected to because of the following informalities: "...in which combined the wavelength converter,..." is grammatically incorrect; for examination purposes it will be interpreted as "... which **is** combined **with** the wavelength converter,...". Appropriate correction is required.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section

351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims1, 2, and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyake (US 6542524).

As for claim 1 Miyake discloses in fig 1, a laser system which is a coherent light source used in one of a photodynamic therapy (PDT) and a photodynamic diagnosis (PDD), comprising: a pump laser 105 emitting at least a laser beam with a specific wavelength; a wavelength converter 115 converting said specific wavelength of said laser beam emitted by said pump laser into a wavelength adapted (intended use) to said PDT and said PDD; and an optical transmitting and outputting device 125 receiving and transmitting said laser beam for illuminating at least a specific target through an optical outputting device located an end thereof.

As for claim 2, Miyake discloses in fig 2, a first coupling lens 220 located between said pump laser and said wavelength converter 115 for passing therethrough said laser beam.

As for claim 6, Miyake discloses in fig. 2, at least a second coupling lens 230 to coincide said laser beam from said wavelength converter 115 to said optical transmitting and outputting device.

8. Claims 1, 4, 5, 20,21,26,37,38, and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by Lawandy (US 6254596).

As for claims 1 and 21, Lawandy discloses in fig. 2, A laser system which is a coherent light source used in one of a photodynamic therapy (PDT) and a

photodynamic diagnosis (PDD), comprising: a pump laser 12 emitting at least a laser beam with a specific wavelength; a wavelength converter (13 or 14) converting said specific wavelength of said laser beam emitted by said pump laser into a wavelength adapted to said PDT and said PDD (intended use); and a laser resonator system (Fig. 3), which is combined with the wavelength converter (13 or 14), to enhance intensity of the laser beam; and an optical transmitting and outputting device 16 receiving and transmitting said laser beam for illuminating at least a specific target through an optical outputting device located an end thereof.

As for claim 4, Lawandy discloses, optical transmitting and outputting device comprises at least a fiber 16 for transmitting and at least a light pen for outputting (3/56-67).

As for claim 5 Lawandy discloses, said transmitting and outputting device is connected to said wavelength converter (13 or 14) by means of a fiber pigtail 16.

As for claim 20, wherein said pump laser is one of a Nd:YAG laser and a $Nd:YVO_4$ laser for emitting a laser beam with a wavelength of 1.064 μm.

As for claim 26, wherein said laser resonator system is an upright lens system comprising a pair of reflectors (15c and 15d)

As for claim 37, Lawandy discloses in fig. 2, A laser system which is a coherent light source used in one of a photodynamic therapy (PDT) and a photodynamic diagnosis (PDD), comprising: a pump laser (see 6/30-40) emitting at least a laser beam with a specific wavelength; a laser gain medium 12 absorbing said laser beam emitted by said pump laser for being excited to emit a second laser beam with a second specific

wavelength; a wavelength converter (13 or 14) converting said specific wavelength of said laser beam emitted by said pump laser into a wavelength adapted to said PDT and said PDD (intended use); and a laser resonator system (Fig. 3), which is combined with the wavelength converter (13 or 14), to enhance intensity of the laser beam; and an optical transmitting and outputting device 16 receiving and transmitting said laser beam for illuminating at least a specific target through an optical outputting device located an end thereof.

As for claim 38, Lawandy discloses, said laser resonator system is an upright lens system comprising a pair of reflectors (See 4/57-67).

As for claim 44, Lawandy discloses, said laser gain medium is one of Nd:YAG crystal and Nd:YVO_4 crystal (See 6/16-17).

9. Claims 1, 6, 7, 20, 21, 24, and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Davenport et al. (US 5151909).

As for claims 1 and 21, Davenport discloses in figs (1 and 14), A laser system which is a coherent light source used in one of a photodynamic therapy (PDT) and a photodynamic diagnosis (PDD), comprising: a pump laser 18 emitting at least a laser beam with a specific wavelength; a wavelength converter 22 converting said specific wavelength of said laser beam emitted by said pump laser into a wavelength adapted to said PDT and said PDD (intended use); and a laser resonator system (16 and 14), which is combined with the wavelength converter 22, to enhance intensity of the laser beam; and an optical transmitting and outputting device (46a and 46b) receiving and

transmitting said laser beam for illuminating at least a specific target through an optical outputting device located an end thereof (intended use).

As for claims 6 and 24, Davenport discloses, a second coupling lens 44 to coincide said laser beam from said wavelength converter 22 to said optical transmitting and outputting device (46a and 46b).

As for claim 20, Davenport discloses, said pump laser is one of a Nd:YAG laser and a Nd:YVO_4 laser for emitting a laser beam with a wavelength of 1.064 μm. (See 9/67-68)

As for claims 7 and 25, said second coupling lens 22 is connected with said optical transmitting and outputting device by means of a fiber pigtail 46a.

10. Claims 1, 8,9, 17-19, 21, 26,27,30, and 34-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Meyer et al. (US 6101023).

As for claims 1 and 21, Meyer discloses, A laser system which is a coherent light source used in one of a photodynamic therapy (PDT) and a photodynamic diagnosis (PDD), comprising: a pump laser (36 or 48; See 4/38-40) emitting at least a laser beam with a specific wavelength; a wavelength converter (20, 22, 24, 28, or 30; See abstract) converting said specific wavelength of said laser beam emitted by said pump laser into a wavelength adapted to said PDT and said PDD (intended use); and a laser resonator system (between 32 and 34), which is combined with the wavelength converter (20, 22, 24, 28, or 30), to enhance intensity of the laser beam; and an optical transmitting and outputting device 34 receiving and transmitting said laser beam for illuminating at least

a specific target through an optical outputting device located an end thereof. (Note 38 is the front face of 28; 7/56-58)

As for claims 8, and 12, Meyer discloses a PPLN crystal (see 7/19-22) being used as a wavelength converter (20, 22, 24, 28, or 30).

As for claim 13 Meyer discloses, wherein said wavelength converter (24 or 30) utilizes one of a QPM-optical parametric generator (OPG) (20, 22, 28, or 38) (See 7/56-62) and a QPM-OPG series-connected with a nonlinear wavelength converter (24 or 30) to convert said specific wavelength of said laser beam. Alternatively, wherein said wavelength converter (20, 22, 28, or 38) utilizes one of a QPM-optical parametric generator (OPG) (24 or 30) (See 8/27-29) and a QPM-OPG series-connected with a nonlinear wavelength converter (20, 22, 28, or 38) to convert said specific wavelength of said laser beam.

As for claim 17, wherein said QPM-OPG series-connected with a nonlinear wavelength converter 28 comprises a plurality of series-connected grating periods (20 and 22), in which a first grating period is a QPM-OPG gain medium 28 and another is a nonlinear converting medium 24.

As for claim 18,Meyer discloses, said QPM-OPG series-connected with a nonlinear wavelength converter 28 comprises a first QPM crystal for an OPG gain medium and at least a second QPM 24 crystal for a nonlinear converting medium.

As for claim 19, Meyer discloses, said QPM-OPG series-connected with a nonlinear wavelength converter 28 comprises a QPM crystal for an OPG gain medium and at least a nonlinear crystal 24 for a nonlinear converting medium.

As for claim 27 Meyer discloses, said laser resonator system is an upright lens system comprising a pair of reflectors (32 and 34; See 8/36-39).

As for claim 30, Meyer discloses, wavelength converter utilizes one of a QPM-optical parametric oscillator (OPO) (28 or 38 and 30; See 7/19-22) and a QPM-OPO series-connected with a nonlinear wavelength converter to convert said specific wavelength of said laser beam.

As for claim 34, Meyer discloses, said QPM-OPO (30; see 7/65-67) series-connected with a nonlinear wavelength converter 28 comprises a plurality of series-connected grating periods (20 and 22), in which a first grating period is a QPM-OPO 30 gain medium and another is a nonlinear converting medium.

As for claim 35, Meyer discloses, wherein said QPM-OPO (30; see 7/65-67) series-connected with a nonlinear wavelength converter 28 comprises a first QPM crystal for an OPO gain medium 28 and at least a second QPM crystal for a nonlinear converting medium 30.

As for claim 36, wherein said QPM-OPO (30; see 7/65-67) series-connected with a nonlinear wavelength converter (16, 18, 20, 22, 24, or 40) comprises a QPM crystal for an OPO 30 gain medium and at least a nonlinear crystal 28 for a nonlinear converting medium.

11. Claims 1-3 and 21-23 rejected under 35 U.S.C. 102(b) as being anticipated by Injeyan et al. (US 5796761).

As for claims 1 and 21, Injeyan discloses, 21. A laser system for a laser source used in one of a PDT and a PDD, comprising: a pump laser 20 emitting at least a laser beam with a specific wavelength; a wavelength converter 92 converting said specific wavelength of said laser beam emitted by said pump laser into a wavelength adapted to said PDT and said PDD; and a laser resonator system (bound by reflectors 72, 80, 82, and 94), which is combined with the wavelength converter 92, to enhance intensity of the laser beam; and an optical transmitting and outputting device 94 receiving and transmitting said laser beam for illuminating at least a specific target through an optical outputting device located an end thereof (intended use). Mirror receives reflects and transmits an output.

As for claim 2 and 22, Injeyan discloses, a lens that is between the pump laser 20, and the resonator (bound by reflectors 72, 80, 82, and 94) and the wavelength converter 92.

As for claim 3 and 23, Injeyan discloses wherein said first coupling lens has an anti-reflecting surface coating (6/45-47), a specific curvature and a specific focal length to receive (all lenses inherently have a curvature and a focal length) and coincide an energy of said laser beam from said pump laser to said wavelength converter 92.

As for claim 29, Injeyan discloses, said laser resonator system is a circular lens system comprising four reflectors (72, 80, 82, and 94).

12. Claims 1, 8-11,13, 21, 37, and 41-43 are rejected under 35 U.S.C. 102(b) as being anticipated by Wiechamann et al. (US 6009110).

As for claims 1, 21, and 37, Wiechamann discloses, A laser system for a laser source used in one of a PDT and a PDD, comprising: a pump laser (30 or 32) emitting at least a laser beam with a specific wavelength; a laser gain medium 30 absorbing said laser beam emitted by said pump laser for being excited to emit a second laser beam with a second specific wavelength; a wavelength converter (40 and 44) converting said specific wavelength of said laser beam emitted by said pump laser into a wavelength adapted to said PDT and said PDD (intended use); a laser resonator system (between 24a-c), which is combined with the wavelength converter(40 and 44), to enhance intensity of the laser beam; and an optical transmitting and outputting device (24b and 36) receiving and transmitting said laser beam for illuminating at least a specific target through an optical outputting device located an end thereof (intended use).

As for claims 8, Wiechamann discloses, wavelength converter (40 and 44) comprises at least a quasi-phase matching (QPM) crystal (3/5-9).

As for claim 9 said wavelength converter (40 and 44) further comprises a temperature controller to adjust said QPM crystal at a specific temperature (3/1-3).

As for claim 10 and 11 wherein said wavelength converter (40 and 44) further comprises a micro-translation device (3/1-3) to select a grating period from a multi-grating of said QPM crystal. The temperature controller controls the period of the grating by making the crystal expand or contract slightly, therefore the limitation of the claims are met.

As for claim 13, wherein said wavelength converter (40 and 44) utilizes one of a QPM-optical parametric generator (OPG) and a QPM-OPG series-connected with a

nonlinear wavelength converter (40 and 44) to convert said specific wavelength of said laser beam.

As for claim 41, said laser resonator system is an non-coaxial laser resonator system (between 24a-c) comprising an upright laser resonator system (between 24a-c) coupled with an optical lens external to said upright resonator device for resonator said laser gain medium to emit a laser beam with a third specific wavelength (2/65-67).

As for claim 42, said external optical lens is a lens coated by a dielectric and located at a pumping facet of said laser gain medium (See 8/31)

As for claim 43, said pump laser is a laser having a semiconductor emitting a wavelength of one of 808 nm and 809 nm (2/57-59).

13. Claims 1, 13, 14, 21,27-31,37, 39 and 40 rejected under 35 U.S.C. 102(b) as being anticipated by Zhu et al. (US 2002/0154663).

As for claims 1, 21, and 37 Zhu discloses in figure 8, 37. A laser system for a laser source used in one of a PDT and a PDD, comprising: a pump laser (1 or 3) emitting at least a laser beam with a specific wavelength; a laser gain medium 3 absorbing said laser beam emitted by said pump laser for being excited to emit a second laser beam with a second specific wavelength; *a wavelength converter* 8 converting said specific wavelength of said laser beam emitted by said pump laser into a wavelength adapted to said PDT and said PDD (intended use); a laser resonator system (bound by 5 and 5'), which is combined with the wavelength converter 8, to enhance intensity of the laser beam; and an optical transmitting and outputting device 5

receiving and transmitting said laser beam for illuminating at least a specific target through an optical outputting device located an end thereof.

As for claim 13 and 30, said wavelength converter 8 utilizes one of a QPM-optical parametric generator (OPG) 8 (see [0006]) and a QPM-OPG series-connected with a nonlinear wavelength converter 8 to convert said specific wavelength of said laser beam.

As for claim 14 and 31, said nonlinear wavelength converter is fabricated by one of a second harmonic generation (SHG) and a sum frequency generation (SFG). (See Paragraph [0069])

As for claim 27, said laser resonator system is an upright lens system 5 comprising a reflector and a dielectric coated lens suitable for optical reflection and penetration (See paragraph [0065]) and located at an output facet of a QPM crystal used by said wavelength converter 8.

As for claim 28, 39, and 40, laser resonator system is an upright lens system (between 5 and 5') comprising a pair of dielectric coated lenses (5 and 5') suitable for optical reflection and penetration and respectively (need to allow reflection and penetration for device to work) located at: an output facet 5 and a pumping facet of a QPM crystal, and at an pumping facet 5' of a laser gain medium 3 used by said wavelength converter 8.

14. Claims 1, 13, 15,16, 21, 30 32, and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Laurell (US 6259711).

As for claims 1 and 21, Laurell discloses in figure 9, A laser system for a laser source used in one of a PDT and a PDD, comprising: a pump laser 7 emitting at least a laser beam with a specific wavelength; a wavelength converter 2 converting said specific wavelength of said laser beam emitted by said pump laser into a wavelength adapted to said PDT and said PDD (intended use); and a laser resonator system (between 3 and 4), which is combined with the wavelength converter 2, to enhance intensity of the laser beam; and an optical transmitting and outputting device (the reflector 4 is outputting the output) receiving and transmitting said laser beam for illuminating at least a specific target through an optical outputting device located an end thereof.

As for claims 13, and 30, Laurell discloses, said wavelength converter 2 utilizes one of a QPM-optical parametric generator (OPG) (see 11/1-3) and a QPM-OPG series-connected with a nonlinear wavelength converter 2 to convert said specific wavelength of said laser beam.

As for claim 15 and 32, said wavelength converter 2 is a monolithic QPM crystal having a plurality of gratings connected in parallel (See 7/39-43 or 53-56) for being an OPG gain medium for said QPM-OPG.

As for claims 16 and 33 wherein each of said gratings further comprises multi-grating periods for an OPG gain medium (See 7/46-49)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey D. Lane whose telephone number is (571) 272-1676. The examiner can normally be reached on Monday thru Friday 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeffrey D Lane
Examiner
Art Unit 2828

JDL

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PRIMARY EXAMINER